United States Department of the Interior

NATIONAL PARK SERVICE
Grand Canyon National Park
P.O. Box 129
Grand Canyon, Arizona 86023-0129

IN REPLY REFER TO:

Dear Interested Party:

Reference: Grand Canyon National Park, Desert View Housing and Management Support

Subject: Public Review of Environmental Assessment

Enclosed is an environmental assessment (EA) for the proposed construction of additional housing units and residential support facilities at Desert View. The proposed activities are part of a comprehensive effort under the 1995 General Management Plan to accommodate increased visitation at Desert View while minimizing resource impacts and conflicts. The proposed activities are needed because existing facilities cannot adequately accommodate existing needs, nor the needs expected to be created by projected increases in visitation at Desert View.

If you wish to comment on this EA, you may mail your comments to the Superintendent, Grand Canyon National Park, Attn: Sara White, Compliance Officer, P.O Box 129, Grand Canyon, AZ 86023. Please be aware that names and addresses of respondents may be released if requested under the Freedom of Information act. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold from the record a respondent's identity, as allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations or business, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety. Anonymous comments may be included in the public record. However, the National Park Service is not legally required to consider or respond to anonymous comments. We would appreciate receiving your comments no later that **September 18, 2001**. If you have any questions regarding this project, please call Sara White at 520-638-7956. The EA is available at the following website as well http://www.nps.gov/grca/mgmt/index.htm.

Sincerely,

Joseph F. Alston
Superintendent

Enclosure

Environmental Assessment/ Assessment of Effect
August 2001

Desert View Housing and Management Support

Grand Canyon National Park • Arizona

Public Comment

If you wish to comment on the environmental assessment, you may mail comments to the name and address below. This environmental assessment will be on public review for 30 days; comments are due by September 18, 2001. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold from the record a respondent's identity, as allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please Address Comments to:
Joseph Alston, Superintendent,
ATTN: Sara White, Compliance Officer
Grand Canyon National Park
P.O. Box 129
Grand Canyon, AZ 86023

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PUBLIC COMMENT 1

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1. PURPOSE AND NEED

INTRODUCTION

The National Park Service (NPS) proposes construction of several buildings (containing approximately 70 housing units) to replace substandard units and meet additional housing needs. New housing would consist primarily of multiplex buildings (duplexes, fourplexes, eightplexes, and a dorm or dorms), plus a small number of single family buildings. Recreational Vehicle (RV) sites would be replaced to accommodate the needs of seasonal employees who live in RV's. Residential support facilities such as an employee laundry and new employee recreation facilities would be included. A ranger operations and maintenance facility for the National Park Service and a maintenance support facility would be constructed for the park concessioner. The proposed activities would occur within disturbed areas of Desert View, Grand Canyon National Park, Coconino County, Arizona (See Appendix E) and would implement a portion of the *1995 General Management Plan* (GMP) for Grand Canyon National Park. Work would begin during the fall of 2001 with construction of two or more multiplex housing units. Other activities would occur within the next five years as funding is secured.

PURPOSE AND NEED

The proposed activities are part of a comprehensive effort under the *1995 General Management Plan* (GMP) to accommodate more visitors at Desert View, while minimizing resource impacts and conflict. The proposed activities are needed because existing facilities cannot adequately accommodate existing needs, nor the needs expected to be created by projected increases in visitation. In the Environmental Impact Statement (page 202) for the GMP, it was estimated that visitation would increase along the South Rim (including Desert View) by 60% from 1993 to 2010, with use of the increasing by 45%.

The 1995 GMP (page 37) contains the following pertinent statements related to proposed changes in the Housing and Management Support areas at Desert View:

- Housing

Approximately 70 housing units would be built over a five year period to replace about 10 substandard units and to meet additional housing needs. This housing would be developed in a disturbed area southeast of Arizona Highway 64; any housing that does not fit within this highly disturbed area would be tightly clustered in areas where utility extensions already exist. All housing would be removed from the [concessioner] area just south of the existing parking lot. That area would be converted to parking and a transit facility. (The preceding action will be discussed in a future environmental document.)

- Community Services

A new employee laundry and lounge would be built as part of the consolidated housing area. In addition, a small outdoor recreation space would be provided for picnicking and games.

- Management Support Functions

Existing management support facilities would be retained except for the construction of a new maintenance building for [concessioner] and a new NPS ranger operations and maintenance facility. These facilities would be located in disturbed areas currently occupied by substandard management support facilities or housing.

During discussions in March of 2001, an additional need was identified for RV (Recreational Vehicle) spots, to accommodate valuable seasonal employees (typically retirees) who live in RV's. There are currently 12 RV spots at Desert View. These are expected to be removed (and require replacement) because of other construction, including the building of a parking lot elsewhere in Desert View (please see "Management and Planning History" below) and construction of multiplex units in the housing area itself.

The proposed action is intended to implement the above provisions of the GMP. None of the needs identified in the General Management plan have changed significantly. Following are more recent estimates of Desert View housing needs. (These estimates were developed in 1999 and reviewed with NPS staff and non-government employers in March of 2001):

Table 1-1 Housing Needs

A	B	C	D	E	F	G
Total Units Needed	Existing Units	Existing Units to Remain	RV Spots to be Replaced	Replacement Housing Units Needed (B-C-D)	New Housing Units Needed (A-C-D-E)	Proposed Housing Units to be Built
86	42	4	12	26	44	70

Notes:

1. A "unit" is a single abode, consisting of 1 to 3 bedrooms.

2. "Existing units" in column B include all types of units, including permanent housing, trailers, and RV spots. "Existing units to Remain" in column C are permanent housing units.

3. Units to be replaced consist primarily of substandard units. Most of the substandard units are trailers. (All trailers would be replaced.) Also to be replaced would be several housing units that would not be available after construction of parking under the GMP. (Please see above).

4. The above totals include needs for all occupants, including those of the National Park Service, Grand Canyon Association, and Concessioners.

The number of proposed housing units to be built (according to the estimate above) is the same as the GMP figure (70).

All of the staff who would be occupying new housing units are mandatory staff who are employed at Desert View. All of the proposed development is well away from the canyon rim, in an area that will not be seen by visitors.

Management and Planning History

Grand Canyon National Park is currently operating under the direction of the *1995 General Management Plan* (GMP). This plan provides guidance for resource management, visitor use, and general development for a period of 10 to 15 years. Decisions made for Desert View in the GMP include:

- Desert View would become a visitation hub for the East Rim, resulting in increased use of the area.
- A parking lot would be constructed to accommodate 450 private vehicles (including RVs) and 15 buses. The use of three housing units plus 8 RV sites would be eliminated by this action. The use of an existing concessioner maintenance building, and an employee lounge, would also be eliminated.
- In the existing housing area, approximately 70 housing units would be built to replace substandard units and to meet additional housing needs.

- In the existing housing area, new community services would include a new employee laundry, new employee lounge, and a small outdoor recreation space.
- In the existing management support area, existing facilities would be retained except for construction of a new concessioner maintenance building and a new NPS ranger operations and maintenance facility.

Comments from general public scoping included incorporation of screening to limit housing visibility, protection of resources by utilizing previously disturbed areas, use of architecturally compatible building construction, limiting additional housing for concessioners in the park, protection of condors and Mexican spotted owls during construction. Support was expressed for development of housing and management support for park employees. Public scoping comments have been considered in this EA.

This EA incorporates by reference and tiers to the *General Management Plan Environmental Impact Statement* (GMP EIS.)

Please also see "Purpose and Need" above for additional information concerning management and planning history.

ISSUES AND IMPACT TOPICS

Issues are potential environmental problems that may result from federal action, if it is taken. Once issues are identified, they are used to help formulate the alternatives and mitigation measures. Impact topics are then selected for detailed analysis based on substantive issues; environmental statutes, regulations and executive orders; and revised NPS Management Polices (2001). A summary of the impact topics and rationale for selection/dismissal are given below.

Impact Topics Analyzed in this Document

Biotic Communities

Proposed construction would involve the disturbance of vegetation communities. In addition, construction activities have the potential to increase disturbance to adjacent biotic communities. Therefore, this topic will be analyzed in this document.

Exotic Vegetation and Noxious Weeds

Proposed ground disturbance could create conditions favorable to exotic vegetation and noxious weeds. In addition, construction equipment could spread existing populations of exotic vegetation and noxious weeds. Therefore, this topic will be analyzed in this document.

Mexican Spotted Owl, California Condor and American Peregrine Falcon

The U.S. Fish and Wildlife Service has listed the Mexican spotted owl (*Strix occidentalis lucida*) as threatened and the California condor (*Gymnops californianus*) as experimental/nonessential. Mexican spotted owls have potential habitat below the rim near Desert View and California condors frequent the Desert View area. Mexican spotted owls are also listed on the Arizona state list as wildlife of special concern. American peregrine falcons (*Falco peregrinus anatum*) have been removed from the federal threatened and endangered species list. However, the peregrine falcon still remains on the Arizona state list as wildlife of special concern. Peregrine falcons occur near the Desert View area. Proposed activities have the potential to impact these listed species. Therefore, these species will be analyzed in this document.

Please see appendix D for a letter (dated April 9, 2001) from the Fish and Wildlife Service, concerning the Mexican Spotted owl and California condor.

No other threatened or endangered species are impacted by the proposed action. (Please see "impact topics dismissed" below).

Cultural Resources

No historical properties are located at the site or within the area of potential effect (APE). No affected structures are National Register eligible, and there are no potential cultural landscapes or contributing elements to potential cultural landscapes within the site or within the APE. Although archeological surveys have revealed no sites within the project boundaries, project undertakings have the potential to affect previously unknown archeological resources. Sites of special ethnographic significance to tribes exist at Desert View, though none are known to exist within the bounds of proposed development. Cultural resources will be analyzed in this document.

Impact Topics Dismissed from this Document

Geology and Topography

Alteration of geologic processes and features are not proposed in any of the alternatives. No major earthmoving or blasting activities are proposed that would impact the geologic processes or features or cause substantial alteration of the topography. Therefore, this topic will not be further analyzed in this document.

Soils

Desert View is on the Coconino Plateau, which is capped by the Kaibab Formation, which consists of sandstones, redbeds, chert, dolomite and some limestone (NRCS 2000). Soils tend to be shallow, poorly developed, and stable (NPS 1995). Soils derived from the Kaibab Formation are generally characterized by high infiltration capacity, low moisture holding capacity, and low soil fertility (Roundy 1996). The shallow soils in the project area have already been grossly disturbed because the site was initially prepared for construction of housing in the1960's. Importation of soil for fill would not be needed or would be negligible. Therefore, due to prior site grading and installation of infrastructure, there will be no additional disturbance of soil profile or removal of soil nutrient layer. For these reasons, the proposed action would have a negligible effect on soils. Therefore, this topic will not be further analyzed in this document.

Prime and Unique Agricultural Land

The soils and topography within Grand Canyon National Park are not conducive to agriculture. The soils in the vicinity of Desert View tend to be shallow and poorly developed. No prime farmland or unique agricultural lands exist within the Park, and therefore, this topic will not be further analyzed in this document.

Air Quality

Project construction could potentially result in an increase in fugitive dust from soil exposure and disturbance. However, this effect would occur only during the construction period and would be localized and negligible. Water or water-based dust control agents would be applied during construction as necessary to minimize dust. Project activities would increase vehicle emissions from construction equipment. However, emissions would be localized and would have an immeasurable effect on regional or local pollutant levels. Therefore, this topic will not be further analyzed in this document.

Water Resources

Desert View is characterized by the absence of surface water, which generally drains through the ground water system or returns to the atmosphere through evapotranspiration. Surface runoff usually only occurs following severe storm events. This is largely due to the permeable nature of the upper sedimentary layers underlying Desert View (NPS 1995, Roundy and Vernon 1997) and the evapotranspiration potential of the surrounding pinyon-juniper community type (Huntoon n.d.). Due to the evapotranspiration potential and high permeability of the underlying substrate, the proposed developments would negligibly affect water quantity and timing of runoff. Despite the increase of impermeable surfaces created by the proposed developments, most surface water would continue to be lost through evapotranspiration or incorporated into the ground water system. Ground and surface water quality would be negligibly affected by the proposed developments. Increased sedimentation from increased surface runoff and soil erosion would be negligible due to the lack of surface water runoff from Desert View and implementation of best management practices. In addition, the potential impacts of increased sedimentation would be limited to the period of construction and vegetation recovery. A storm water pollution prevention plan (SWPPP) would (if required by the size of the project and other considerations) be developed by the contractor and approved by the park prior to any ground-disturbing activities. All National Pollutant Discharge Elimination System (NPDES) requirements would be met.

The present water storage capacity is sufficient to meet the present and predictable water needs of Desert View for both potable and fire suppression water needs. This proposal would not likely affect water quantity, timing, or quality. Therefore, the water resource topic will not be further analyzed in this document.

Floodplains

Executive Order 11988 requires federal agencies to examine potential risk and impacts of placing facilities within floodplains. Desert View is located at a topographic highpoint and thus there is no opportunity for runoff to accumulate. No floodplains exist at Desert View. Therefore, this topic will not be further analyzed in this document.

Wetlands

Executive Order 11990 requires federal agencies to avoid impacts on wetlands where possible. No jurisdictional wetlands exist at or near Desert View. Therefore, this topic will not be further analyzed in this document.

Threatened, Endangered, and Species of Concern – Plants

The U.S. Fish and Wildlife Service has determined that eight federally listed proposed, threatened, or endangered plant species may occur or have habitat in the Grand Canyon area. (Please see appendix A).

In addition to the federally listed species, the NPS must consider state listed special status species. The Arizona Game and Fish Department has listed seven additional plant species for consideration for projects occurring on the South Rim.

A Grand Canyon National Park Botanist reviewed the project area and determined that habitat for the federal and state listed plant species does not exist at Desert View. This determination is based on site specific knowledge of the Desert View area, reconnaissance of the area, knowledge of the species and habitats in question, and professional judgement. None of the listed plant species are known to occur in the area. Therefore, this topic will not be further analyzed in this document.

Threatened, Endangered, and Species of Concern – Wildlife

In addition to the Mexican spotted owl and California condor, the U.S. Fish and Wildlife Service has listed eight other species as proposed, threatened, or endangered wildlife species that may occur or have habitat in the Grand Canyon area. (See appendix A.) In addition to the Mexican spotted owl and American peregrine falcon, the Arizona Game and Fish Department has listed four other wildlife species for consideration for projects occurring on the South Rim. (See appendix A.)

A Grand Canyon National Park Wildlife Biologist has determined that habitat for the additional federal and state listed species (not including the Mexican Spotted Owl, California condor, and American peregrine falcon) does not exist at Desert View. This determination is based on site specific knowledge of the Desert View area, knowledge of the species and habitats in question, and professional judgement. None of these additional species is known to occur in the Desert View area. Therefore, species other than the Mexican Spotted Owl, California condor, and American peregrine falcon would not be affected by the proposed action and will not be further analyzed in this document.

Socioeconomic Environment

The socioeconomic environment consists of local and regional businesses and residents, the local and regional economy, and park concessions. The local economy and most businesses in the surrounding communities are based on professional services, construction, tourist sales and services, and educational research. The regional economy is strongly influenced by tourist activity. The GMP EIS discussed the socioeconomic environment and impacts extensively.

None of the proposed alternatives would change local or regional land use. Park businesses would not suffer any appreciable adverse short or long-term economic impacts from any of the alternatives because traffic flow into and out of Desert View would not be affected. The short and long-term socioeconomic impacts of implementing any of the action alternatives would be consistent with the impacts described in the GMP EIS. Therefore, this topic will not be further analyzed in this document.

Environmental Justice

Executive Order 12898 requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations. None of the proposed alternatives would have a disproportionately high and adverse effect on any minority or low-income population or community. The proposed action would not have health or environmental effects on minorities or low income populations or communities as defined in the Environmental Protection Agency's Draft Environmental Justice Guidance (July 1960). Therefore, this topic will not be further analyzed in this document.

Visitor Experience

Desert View is located on Arizona Route 64 and serves as the east entrance to Grand Canyon National Park. For visitors utilizing the east entrance, Desert View offers the first stop for information, restrooms, water, food, souvenirs, and gasoline. In FY 1997, 1.8 million visitors to the South Rim area entered the park through the east entrance. Desert View offers splendid views of the Painted Desert and the Little Colorado. The Watchtower is located at Desert View and is both a major visitor attraction and a nationally significant historic property. Other Desert View facilities include a 140 vehicle parking lot, a gas station, a General Store, a gift shop and deli, a small NPS contact station, restrooms, and a campground. Proposed activities would be outside of visitor use and view areas. Existing buildings in the housing and maintenance areas are not visible from the Watchtower, the highest point on the South Rim, or other visitor areas because of topography and vegetation. Visitor activities would be negligibly affected by the proposed activities and therefore, this topic will not be further analyzed in this document.

2. ALTERNATIVES

ITEMS APPLICABLE TO ALL ACTION ALTERNATIVES

The descriptions of alternatives are based on best information available at the time of this writing. If changes during design were not consistent with the intent and effects of the selected alternative, then additional compliance would be needed.

All action alternatives meet the following criteria:

- Meet as closely as possible the objectives and decisions made in the GMP,
- Utilize existing roads and disturbed areas wherever possible,
- Avoid adversely impacting the historic district,
- Minimize adverse impacts to prehistoric and historic archeological sites.

MITIGATION MEASURES APPLICABLE TO ACTION ALTERNATIVES

Mitigation measures have been designed to minimize, reduce, or eliminate impacts of the proposed activities. The following mitigation measures would apply to Action Alternatives.

Contractor Orientation

Contractors working in the park are given orientation concerning proper conduct of operations. This orientation is provided in both written form and verbally (at a preconstruction meeting.) This policy would continue on proposed Desert View projects. Orientation topics for Desert View work would include:

- Wildlife should not be approached or fed.
- Collecting of any park resources, including plants and animals, is prohibited.
- Contractor must have a safety policy in place and follow it.
- Other environmental concerns and requirements discussed elsewhere in this Environmental Assessment would be addressed.

Air Quality

In order to minimize impact to local air quality, water would be applied as a dust-control agent as necessary during construction.

Water Quality

To minimize potential impacts to water quality, the following mitigation measures would be incorporated into the action alternatives.

- A storm water pollution prevention plan (SWPPP) would (if required) be developed by the contractor and approved by the park prior to any ground-disturbing activities. All National Pollutant Discharge Elimination System (NPDES) requirements would be met.
- Standard erosion control measures such as silt fences, sand bags, or equivalent control methods would be used to minimize any potential sediment delivery to streams.

Exotic Animals

To prevent the importation of exotic animals such as rats and mice, all construction materials would be inspected. Such inspections should be conducted through consultation with the park's Integrated Pest Manager.

Exotic Vegetation and Noxious Weeds

In order to prevent the introduction and minimize the spread of exotic vegetation and noxious weeds, the following mitigation measures would be incorporated into the action alternatives.

- Existing populations of exotic vegetation at the construction site would be treated prior to construction activities.
- All heavy construction equipment that would leave the road (i.e. bulldozers and backhoes) would be pressure washed prior to entering the park.
- The location of the staging area for construction equipment would be park-approved and treated for exotic vegetation.
- Parking of vehicles would be limited to existing roads or the staging area.
- Any fill, rock, or additional topsoil needed would be obtained from a park-approved source.
- All areas disturbed by construction would be revegetated using site adapted native seed and/or plants.
- Monitoring and follow-up treatment of exotic vegetation would occur for 2 to 3 years after construction is completed.

California Condor

In order to protect the California condor, the following mitigation measures would be incorporated into any action alternatives.

- If a California condor visits the construction site, construction activities within 92 meters (300 feet) of the bird would cease until it leaves on its own or is induced to leave by specially trained staff.
- To protect any undiscovered California condor nest site, the area would be periodically monitored during construction and the construction contract would include provisions for discovery of California condor nest sites. These provisions would require the cessation of construction activities until park staff re-evaluates the project and would allow modification of the contract for any protection measures determined necessary to protect the California condor.
- The following recommendations of the U.S. Fish and Wildlife Service (see appendix D) would be implemented: If blasting is to be part of the project, a determination should be made prior to blasting as to whether condors are roosting within 1 mile of the project area. If condors occur within one mile, blasting should be postponed until the condors leave the area. The U.S. Fish and Wildlife Service also recommends that procedures be developed and implemented to monitor, prevent, and immediately remove any fuels or fluids in the project area.
- Contractor personnel would be briefed or trained to ensure that there are no hazards or attractants available to condors, and to ensure that they are aware of other precautions needed to ensure safety of the birds. Contractors would be required to keep neat sites so that there are no hazards or attractants left for condors. Contractors would be required to have a spill plan in place.

Mexican Spotted Owl

Surveys are under way to determine the presence or absence of nesting Mexican Spotted Owls in the Desert View vicinity. Two seasons of surveys are needed (to be completed in the summer of 2002). Until the surveys are complete, construction activities that would disturb nesting owls would be limited to the non-breeding season (September 1 to February 28) to reduce the potential for disturbance to

nesting birds. If surveys reveal the presence of nesting owls within 0.5 miles of the project site, construction would continue to be limited to the non-breeding season.

The U.S. Fish and Wildlife Service (see Appendix D) also recommends that if blasting is to be part of the project, and nesting owls are found within 1.0 miles of the project site, then blasting should be limited to the non-breeding season, or other means should be taken to eliminate disturbance impacts.

Special Status Species

In order to protect any unknown or undiscovered threatened, endangered, or special status species, the construction contract would include provisions for the discovery of such. These provisions would require the cessation of construction activities until park staff evaluates the project impact on the discovery and would allow modification of the contract for any protection measures determined necessary to protect the discovery.

Architectural Guidelines

Construction of new buildings would follow the recommendations of the Grand Canyon National Park Architectural Guidelines and other appropriate documents. Architectural styles and finishes would be compatible with other Desert View buildings.

Cultural Resources

In order to minimize the impacts of construction activities on cultural resources, the following mitigation measures would be incorporated into the action alternatives.

Surveys for archaeological resources within the area of proposed construction have been conducted. No resources were found. If found necessary during construction, archeological monitoring may be needed as a further mitigation measure.

Should previously unidentified archeological resources be discovered during the course of the project, work in that location would stop until the resources are properly recorded by an NPS archeologist and evaluated under the eligibility criteria of the National Register of Historic Places. If (in consultation with the Arizona State Historic Preservation Office) the resources were determined eligible, appropriate measures would be implemented either to avoid further resource impacts or to mitigate their loss or disturbance. In compliance with the Native American Graves Protection and Repatriation Act of 1990, the National Park Service would also notify and consult concerned tribal representatives for the proper treatment of human remains, funerary and sacred objects should these be discovered during the course of the project.

No undertakings affecting historic properties are expected to be part of any of the alternatives. Any undertakings affecting historic buildings and structures would be carried out in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995) and other applicable NPS cultural resources policies and guidelines.

ALTERNATIVE A – NO ACTION

The no action alternative would maintain the existing condition at Desert View and provides the baseline for comparison of the action alternatives. Existing housing units (primarily consisting of trailers) would be retained. No new maintenance support facilities would be constructed.

Alternative A does not satisfy the park's critical need for new or replacement housing or for management support facilities at Desert View.

ALTERNATIVE B

Alternative B would consist of retaining existing facilities, and providing for any additional housing or maintenance support needs with facilities outside the Desert View area. To supplement existing housing, personnel would make use of housing facilities elsewhere, either in the park or outside the park. Any new maintenance facilities would be constructed elsewhere, again either in the park, or outside the park.

Alternative B does not satisfy in a practical way the park's critical housing and management support needs. The closest existing housing that could be purchased or leased by employees is in either Flagstaff or Williams Arizona, each approximately 90 miles away, a very long distance for commuting. The South Rim Village already has a severe housing shortage. Tusayan and Cameron do not have the necessary facilities, nor is construction of new housing practical because there is a lack of space and lack of water availability.

Management support facilities need to be located at Desert View in order to provide quick response to emergencies and to provide onsite oversight of safety and operations.

ALTERNATIVE C – PREFERRED

Approximately 70 housing units would be constructed to replace substandard units and meet additional housing needs, and to construct residential support facilities such as a new employee laundry, and employee recreation area. An appropriate number of housing units would be built in conformance with the Architectural Barriers Act of 1968 (P.L. 90-480), the Rehabilitation Act of 1973 (P.L. 93-112), and the 1984 Uniform Federal Accessibility Standards (UFAS), 49 CFR 31528. Replacement of approximately 12 RV sites for seasonal employees would also be included. A new ranger operations and maintenance facility for the National Park Service, and a new support facility for the park concessioner, would also be constructed.

Construction would be in areas already disturbed by earlier building construction or by the installation of existing underground utilities. Much of the necessary existing underground utility infrastructure is in place. Connection of new structures to these existing utilities would be required and any undersized or substandard utilities would be replaced. Any necessary utilities not already in place would be provided. Existing streets and parking would be utilized where ever possible, and would be upgraded or supplemented where necessary.

New buildings would be constructed in accordance with Grand Canyon National Park Architectural Guidelines, to ensure that the new buildings are in character with other buildings at Desert View, and with the general character of buildings within the park.

Alternative C would provide for the critical needs of the park and concessioners, and would do so away from visitor areas in locations already disturbed by earlier building construction or by earlier installation of underground utilities.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that "[t]he environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

- Assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- Preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- Achieve a balance between population and resource use that will permit high standard of living and a wide sharing of life's amenities; and
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources

NPS policy requires identification of an environmentally preferred alternative. Alternative C is the environmentally preferred alternative for the following reasons:

- Under Alternative C, construction would take place in already-disturbed area
- Under Alternative C, measures would be taken to restore areas previously disturbed by earlier construction or by other effects of human activity. Neither Alternative A nor Alternative B would provide these benefits.
- Under Alternative C, extensive populations of exotic plant species would be removed. Neither Alternative A nor Alternative B would provide this benefit.
- Alternative C would minimize the need for employees to commute to the area, which would minimize the use of vehicles and the production of carbon dioxide and other undesirable byproducts of vehicle use.
- Alternative C would provide for the best protection of environmental resources in the Desert View area, by supplying housing and management support facilities for employees whose duties include protection of the environment.
- Alternative C would provide for the best human environment, by providing adequate facilities for living and working, and for meeting the needs of visitors.

COMPARISON OF ALTERNATIVES

The following section summarizes the alternatives by proposed activities and impacts. Table 2-1 summarizes the proposed actives, which are described in detail under each alternative. Table 2-2 summarizes the impacts of the alternatives by impact topics which are described in detail in Chapter 4 Environmental Consequences.

Table 2-1 Comparison of Proposed Activities

Proposed Activity	Alternatives		
	A	B	C
Removal of existing structures	None	None	26 units
Replacement of RV sites	None	None	12 sites
New road construction	None	None	As necessary, new road segments to access new housing and other buildings within disturbed area.
Construction of new and replacement housing	None	None	70 Units
Parking spaces provided for RV sites	None	None	12 spaces
New and replacement parking spaces provided for housing	None	None	140 spaces
Other NPS facilities	None	None	Ranger operations and maintenance facility, employee laundry, lounge and outdoor recreation facility
Other concessioner facilities	None	None	Maintenance facility

Table 2-2 Comparison of Impacts

Impact Topic	Alternatives		
	A	B	C
Biotic Communities	No direct/indirect impacts would be expected due to the no-action alternative. Cumulative impacts (due to other foreseeable future development) would be negligible because impacts would primarily occur in areas where the biotic communities are already degraded.	No direct/indirect impacts would be expected due to this alternative. Cumulative impacts (due to other foreseeable future development) would be negligible because impacts would primarily occur in areas where the biotic communities are already degraded.	Overall direct, indirect, and cumulative impacts to biotic communities would be negligible due to existing degraded condition of the impacted habitat and the ubiquity of this community type. The biotic community would be improved where previously disturbed areas were revegetated.
Exotic Vegetation and Noxious Weeds	No direct or indirect impacts would be expected due to the no-action alternative. Cumulative impacts (due to other foreseeable future development) would be minor and long-term, and would include the continued spread of existing populations and minor increase in risk of spread or introduction of exotic vegetation.	No direct or indirect impacts would be expected due to this alternative. Cumulative impacts (due to other foreseeable future development) would be minor and long-term, and would include the continued spread of existing populations and minor increase in risk of spread or introduction of exotic vegetation.	Prevention and mitigation measures associated with the project should be sufficient to ensure exotic vegetation does not become a major concern at Desert View. Augmented exotic vegetation control measures would provide an improvement to existing controls. For these reasons, direct, indirect and cumulative impacts under this alternative would be negligible.
Mexican Spotted Owl (TES)	Alternative A would have no direct or indirect impacts on the Mexican spotted owl. Cumulative impacts (due to other foreseeable future development) would be negligible and long-term, because foraging habitat which might potentially be lost is of marginal quality due to the high level of existing development, roads, and human use, and because mitigation measures to limit disturbance due to construction activities would be taken.	Alternative B would have no direct or indirect impacts on the Mexican spotted owl. Cumulative impacts (due to other foreseeable future development) would be negligible and long-term, because foraging habitat which might potentially be lost is of marginal quality due to the high level of existing development, roads, and human use, and because mitigation measures to limit disturbance due to construction activities would be taken.	Direct, indirect, and cumulative impacts of this alternative would be negligible because any loss of habitat is not likely to affect owls, and because measures to mitigate potential disturbance to nesting owls would be taken under this alternative and under other foreseeable future developments.
California Condor	Alternative A would have no direct or indirect impacts on the California condor. Foreseeable future developments would be primarily contained to existing developed areas and thus would have a negligible long-term cumulative impact on condor habitat.	Alternative B would have no direct or indirect impacts on the California condor. Foreseeable future developments would be primarily contained to existing developed areas and thus would have a negligible long-term cumulative impact on condor habitat.	Direct, indirect, and cumulative impacts on the California condor would be negligible with proper mitigation measures.
American Peregrine Falcon	Alternative A would have no impacts on the American peregrine falcon.	Alternative B would have no impacts on the American peregrine falcon.	This alternative would have negligible direct, indirect, and cumulative impacts on the American peregrine falcon.
Cultural Resources	There are expected to be no	No direct or indirect effects on	Implementation of this

Impact Topic	Alternatives		
	A	B	C
	direct or indirect effects on cultural resources as a consequence of the continuation of current NPS management actions and policies for the area. Increasing visitor use and other foreseeable development at Desert View, however, poses a long-term moderate risk that archaeological or ethnographic resources may be disturbed or diminished without an adequate increase in the park staff's ability to monitor resource conditions, effectively manage visitor use, and implement measures to abate impacts. Steps should be taken to preclude or minimize loss or disturbance of cultural resources as part of any other foreseeable future development, so that any long-term cumulative impacts would be minor.	cultural resources would be expected as a consequence of this alternative, and of the continuation of current NPS management actions and policies for the area. Increasing visitor use and other foreseeable development at Desert View, however, poses a long-term moderate risk that archaeological or ethnographic resources may be disturbed or diminished without an adequate increase in the park staff's ability to monitor resource conditions, effectively manage visitor use, and implement measures to abate impacts. Steps should be taken to preclude or minimize loss or disturbance of cultural resources as part of any other foreseeable future development, so that any long-term cumulative impacts would be minor.	alternative would have *no adverse effect* on the Desert View WatchTower Historic District or on cultural landscapes potentially eligible for the National Register. There would be no impacts to known archeological or ethnographic resources. Direct, indirect, and cumulative impacts of implementation of this alternative would be negligible with proper mitigation measures.

3. AFFECTED ENVIRONMENT

Grand Canyon National Park encompasses 1.2 million acres in northern Arizona. Desert View is located within the southeast portion of the park along the east rim of the Grand Canyon about 53 kilometers (33 miles) northwest of Cameron, Arizona. Desert View serves as the east entrance to the park and is the first park development east entrance visitors encounter.

Natural Resources

Biotic Communities

The dominant vegetation community type in the vicinity of Desert View is juniper/big sagebrush/pinyon pine (*Juniperus osteosperma*/*Artemisia tridentata*/*Pinus edulis*). Total cover is generally 20 to 50 percent with understory species diversity very low. Typical understory species include blue grama, bluegrass, snakeweed, prickly pear, and rabbitbrush.

A wide variety of wildlife species utilize the community types at Desert View area. Common birds include Steller's jay, pinyon jay, raven, violet-green swallow, white-throated swift, hairy and Lewis's woodpecker, rock wren, plain titmouse, several nut hatch species, mountain and western bluebird, mountain chickadee, common bushtit, long eared owls, peregrine falcons, turkey vultures, and black-chinned and broad-tailed hummingbirds. Raptors include red-tailed hawks, sharp-shinned hawks, and great horned owls. Small mammals include the Abert squirrel, rock squirrel, golden-mantled ground squirrel, pocket gopher, striped skunk, deer mouse, and pinyon mouse and voles. Large mammals frequently observed are mule deer, elk, moutain lion, bobcat, badger and coyote.

Exotic Vegetation and Noxious Weeds

Almost 150 exotic plant species are known to exist in Grand Canyon National Park. Exotic vegetation and noxious weeds for Grand Canyon, South Rim are listed in appendix C.

The majority of the exotic plant species that exist on the South Rim have not been documented in the Desert View area. However, there is potential that exotic vegetation could become a major problem at Desert View due to ground disturbance and increased risk of spread. Several populations of invasive exotic plants have been documented near the proposed project site. The primary species of concern in the area are Scotch thistle, Russian knapweed, diffuse knapweed, and spotted knapweed.

Mexican Spotted Owl

The Mexican spotted owl (*Strix occidentalis lucida*) was listed as a threatened species in March 1993. Mexican spotted owls are typically associated with late seral forests and generally found in habitat that include mixed conifer and pine-oak forests, riparian madrean woodland, and sandstone canyonlands (U.S. Fish and Wildlife Service 1995). However, Mexican spotted owls have been found in relatively open shrub and woodland vegetation communities in arid canyonland habitat (Willey 1995), contrary to the typical mature forest habitat believed to be the classical norm.

Nesting habitat is typically in areas with complex forest structure or rocky canyons, and contain mature or old growth stand which are uneven-aged, multi-storied, and have high canopy closure. The majority of nests appear to be in Douglas-fir trees. A wider variety of tree species is used for roosting; however, Douglas-fir is the most commonly used species. Foraging owls use a wider variety of forest conditions than for nesting or roosting (U.S. Fish and Wildlife Service 2000).

Mexican spotted owls consume a variety of prey but commonly eat small and medium-sized rodents such as woodrats, mice, and voles. They may also consume bats, birds, reptiles, and anthropods. A diverse prey base is dependant on the availability and quality of diverse habitats (U.S Fish and Wildlife Service 2000).

The presence of Mexican spotted owls within Grand Canyon National Park was confirmed in 1992 through field surveys. Additional Mexican spotted owl surveys occurred in 1994 and 1995 along the South Rim. These surveys resulted in negative results.

The size and extent of the Mexican spotted owl population at Grand Canyon is currently uncertain. However, surveys and location of discoveries suggest that Mexican spotted owls occupy the rugged canyonland terrain within the Grand Canyon. Discoveries of Mexican spotted owls indicate they are utilizing small stringers of Douglas-fir below the rim (NPS, Spotskey, pers. com., 2000). Mexican spotted owl habitat could exist below the rim in the vicinity of Desert View.

In 2001, surveys were initiated to determine the presence or absence of Mexican spotted owls at Desert View as well as a number of other areas within the park.

The Mexican Spotted Owl Recovery Plan (USDI Fish and Wildlife Service 1995) provides for three levels of habitat management: protected areas, restricted areas, and other forest and woodland types. Protected Activity Centers (PACs) have not been designated in Grand Canyon National Park. However, there are no known owl sites within a 1.6 kilometers (1 mile) radius of Desert View. In addition, there is no habitat within a 1.6 kilometers (1 mile) radius of Desert View, which fall into the definition of protected or restricted areas (mixed conifer, pine-oak $\geq$ 40% slope, and riparian forest types). Vegetation community types within a 1.6 kilometer (1 mile) radius of Desert View are listed in appendix B.

The forest community types in the vicinity of Desert View fall into the category of “other forest and woodland types”. The Mexican Spotted Owl Recovery Plan provides no specific guidelines for other

forest and woodland types. These forests and woodlands are typically not used for nesting and roosting. However, they may provide habitat for foraging and possibly for dispersing (USDI Fish and Wildlife Service 1995).

California Condor

The California condor (*Gymnops californianus*) was listed as an endangered species in March 1967 and remains classified as endangered today. In 1996, the U.S. Fish and Wildlife Service established a nonessential, experimental population of California condors in Northern Arizona. In December 1996 the first condors were released in the Vermilion Cliffs area of Coconino County, Arizona, approximately 48 kilometers (30 miles) north of Grand Canyon National Park. Subsequent releases have occurred in May 1997, November 1997, November 1998, and December 1999 in the same vicinity and Hurricane Cliff area, which is about 60 miles west of Vermilion Cliffs. By declaring the population "nonessential, experimental", the U.S. Fish and Wildlife Service can treat this population as "threatened" and develop regulations for management of the population that are less restrictive than mandatory prohibitions covering endangered species. This facilitates efforts to return the condor to the wild by providing increased opportunities to minimize conflict between the management of the condors with other activities. Within Grand Canyon National Park, the condor has the full protection of a threatened species (NPS 1991).

On July 31, 2001 the population of free-flying condors in Arizona totaled 25. Monitoring data indicate condors are using habitat throughout Grand Canyon National Park, with concentration areas in Marble Canyon, Desert View to the Village on the South Rim, and the Village to Hermits Rest. Single condors and groups of condors have been observed at Desert View multiple times.

Nesting habitat for California condor includes various types of rock formations such as crevices, overhung ledges, and potholes. Potential nesting habitat exists near Desert View below the rim, however, no nest sites are known to occur in the vicinity of Desert View. Condors will forage wherever there is a carcass. Roost sites include cliffs and tall trees, including dead trees (snags) (Fish and Wildlife Service 1996).

Peregrine Falcon

The American peregrine falcon (*Falco peregrinus anatum*) was listed as endangered in 1970. On August 25, 1999, the U.S. Fish and Wildlife Service removed American peregrine falcon from the federal list of endangered and threatened wildlife due to its recovery. However, the American peregrine falcon is listed as a "wildlife of special concern in Arizona" by the Arizona Game and Fish Department. The principal cause of the peregrine's decline was chlorinated pesticides, especially DDT and its metabolite DDE, which accumulated in peregrines as a result of feeding on contaminated prey. This interferes with calcium metabolism and resulted in reduced reproductive success due to thin eggshells.

The population of peregrine falcon in Arizona is steadily increasing. In 1991, the peregrine falcon population in the Rocky Mountain/Southwest region was 367 known pairs; in 1998, the number of pairs increased to 535. In Arizona, the known number of peregrine falcon pairs was 159 in 1999 (U.S. Fish and Wildlife Service 1999).

Peregrine falcons generally nest on cliffs, near water. However, river cutbanks, trees and manmade structures have been used as nesting habitat (U.S. Fish and Wildlife Service 2000). Peregrine falcons feed primarily on other birds, such as songbirds, shorebirds, and waterfowl. The usual method of obtaining prey is by attacking flying birds from above or chasing them from behind.

A peregrine eyrie exists in the Desert View vicinity. This eyrie is known to have been occupied since 1988 and the birds appear to be adapted to humans. The eyrie is in an area of steep rugged terrain, without trails, unlikely to accessed by Grand Canyon visitors.

Cultural Resources

The State Historic Preservation Officer is familiar with the project site and the proposed activities from the Desert View Cultural Landscape studies and planning meetings that occurred in spring 2001 and are ongoing.

Ethnographic Resources

Ethnographic resources are defined by the National Park Service as any "site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it*" (Cultural Resource Management Guidelines* (DO-28: 191). The lands of Grand Canyon National Park are traditionally affiliated with nine Indian tribes:

> Havasupai, Hopi Tribe, Hualapai Tribe, Kaibab Band of Paiute, Navajo Nation, Paiute Indian Tribes of Utah, White Mountain Apache, San Juan Southern Paiute, Pueblo of Zuni.

There are no known ethnographic resources in either the project area or its general vicinity. Copies of the environmental assessment will be forwarded to each affiliated tribe for review and comment. If the tribes subsequently identify the presence of ethnographic resources, appropriate mitigation measures would be undertaken in consultation with the tribes. The location of ethnographic sites would not be made public.

Cultural History Overview

Prehistory

Recent archeological evidence has placed the earliest known cultural activity in the Grand Canyon area to about 8500 BC. This coincides with the Late Paleo-Indian period (ca. 9000-7000 BC) characterized by small groups of nomadic hunters who subsisted primarily on large Pleistocene mammals ("mega-fauna"). The Archaic period (ca. 7000-500 BC) followed next with highly mobile groups of hunters and gatherers dispersed over wide geographic areas. Archaic period sites found throughout the canyon typically consist of lithic scatters, camp sites, chip stone reduction areas, limited activity areas, rock art panels, caves, and rock shelters.

Between ca. 500 BC and AD 1540, ancestral Puebloan people (Kayenta Anasazi) settled along the inner Canyon and on the North and South Rims. Cultural remains identified from the Basketmaker II & III periods (while rare in the Grand Canyon area) are indicative of semi-mobile hunting and gathering subsistence strategies. Hearths, limited activity areas, and pithouses with dispersed artifact scatters have been identified from these periods. Archeological evidence indicates the emergence of a more sedentary and agriculturally centered culture during the later Pueblo I period (ca. AD 800-1000) and Pueblo II period (ca. AD 1000-1150). Among the archeological resources identified with these later periods are pithouses, above ground masonry structures (for habitation and grain storage), kivas, and agricultural features (terraces, garden plots, and check dams). Most of the Puebloan people abandoned the canyon sometime after AD 1170, with only remnant populations remaining.

Cohonina people were also present in the Grand Canyon at approximately the same time as their Puebloan neighbors. While archeological information regarding Cohonina activities in the Canyon is currently limited, mounting evidence suggests that they possessed a complex culture that involved foraging in the vicinity of the Canyon during the summer season. They wintered near Mt. Sitgreaves, where identified sites include pithouses, masonry room blocks, walled compounds, interior hearths, and storage areas.

Historic Period

Protohistoric and historic Native American occupation and use of the Grand Canyon area spans the period between approximately AD 1540 to 1950. The Havasupai and Hualapai were among the groups occupying the canyon during this period. Up until the late 19th century, the Havasupai traditionally spent their winters on the plateau of the South Rim, relocating below the rim to Cataract (Havasu) Canyon during the spring and summer months to grow crops. Historical accounts document ancestral Navajo interactions with the Havasupai during the 1600's. By the mid 19th century, the Navajo made extensive use of Canyon resources for subsistence and religious purposes, and continued to graze sheep, goats and horses in the vicinity into the 1930s and 40s. The Hopi, Southern Paiute and Zuni have also at various times either occupied the Grand Canyon, procured and utilized Canyon resources and/or traded with the Havasupai and other groups. The Grand Canyon figures prominently in the origin/religious beliefs and ceremonial practices of these people. Traditional Hopi and Zuni beliefs hold the Grand Canyon as the sacred place from which their ancestors emerged to the present world.

The first historic Euro-American contact with the Grand Canyon and its indigenous Puebloan people began between 1540 and 1542 with the Spanish expedition led by Francisco Vásquez de Coronado. The Canyon was initially considered an impassable barrier, and the Spaniards did not revisit it for another 200 years. During the 19th century, trappers and United States surveyors and military expeditions passed through the area. Some sheep ranching and mining took place in the latter part of the century. However, more economically viable ranching, tourism, and lumbering operations emerged around the beginning of the 20th century, facilitated by completion of rail transportation to the South Rim in 1901. Environmental damage from overgrazing and lumbering led to the establishment of the Grand Canyon Forest Reserve in 1893. Efforts to provide further protection eventually resulted in the establishment of Grand Canyon National Park in 1919.

Desert View

Around 1914, as part of its tourism promotional efforts, the Atchison, Topeka & Santa Fe Railway improved an old section of stagecoach road from El Tovar to Grandview Point and Hance's Ranch. They constructed an additional eight miles of new road to Navajo Point, which the railway began to publicize as "Painted Desert View" and eventually "Desert View." A tent camp provided overnight tourist accommodations for visitors transported by horse-drawn carriage to the site. Later, in the early 1930s, the Atchison, Topeka & Santa Fe constructed permanent facilities at Desert View for the use of its long-time business partner, the Fred Harvey Company. The location then served as a rest stop for tourists brought to the area on day trips via Fred Harvey Co. touring cars and buses departing from Grand Canyon Village, 25 miles to the west.

The 70 ft.-tall Desert View Watchtower, a National Historic Landmark, was designed by renowned architect Mary Colter, and has become the area's defining landmark. Built in 1932 as a souvenir/gift shop, lounge, and Canyon viewing structure, Colter's design incorporated elements recalling prehistoric Anasazi ruins. The Watchtower was also intended to harmonize with the cultural and natural environment, and in that respect also reflected the prevailing design principals of the National Park Service's rustic architectural style utilized throughout the National Park system during that period.

In the 1930s, the National Park Service extended the road from Desert View eastward to Cameron, Arizona where it connected with Highway 64. Desert View then became the eastern entrance to Grand Canyon NP. A stone entrance station was built in 1934 (razed in 1962), and a ranger residence was built in 1936 that is still extant.

Desert View Watchtower Historic District

The housing and maintenance support areas are separated from the Desert View Watchtower Historic District by approximately ¼ mile. In accordance with informal consultations with the State Historic Preservation Officer and discussions with park cultural resources staff, none of the buildings in the

housing and maintenance support areas are on the National Register of Historic Places, or believed to be eligible for the National Register of Historic Places. The Desert View Watchtower Historic District was listed on the National Register of Historic Places in 1995. The district's period of significance spans the years between 1930 to 1941.

Cultural Landscape Resources

Desert View has been a primary visitor area since about 1930, and has many important cultural landscape elements. However, these important cultural landscape elements are not within the area of proposed development, which is well outside of (approximately ¼ mile from) the Desert View Historic District. In accordance with informal consultations with the State Historic Preservation Officer and discussions with park cultural resources staff, the structures to be removed have been identified as non-contributing elements to the cultural landscape. This is because the proposed project area Is outside of the Historic District.

Archeological Resources

National Park Service archeologists conducted reconnaissance surveys of the Desert View area in 1992, 1999, and 2001. A number of sites were identified with cultural material indicating both prehistoric and historic period activities. None of these sites is within the area of proposed development, or close enough to the proposed area of development to be adversely affected by it.

4. ENVIRONMENTAL CONSEQUENCES

The National Environmental Policy Act (NEPA) requires that environmental documents disclose the environmental impacts of the proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented. This section analyzes the environmental consequences of the alternatives on the impact topics. This analysis provides the basis for comparing the alternatives.

METHODOLOGY

The impact analysis and conclusions were based on park staff knowledge of the resources and site; review of existing literature and park studies; information provided by experts within the National Park Service, Federal Highways Administration, and other agencies; and professional judgement.

Intensity. For the purposes of this analysis, intensity or severity of the impact is defined as follows:

Negligible – impact to the resource or discipline is barely perceptible or not measurable, and confined to a small area.

Minor – impact to the resource or discipline is perceptible or measurable, and it is localized.

Moderate – impact is clearly detectable and could have appreciable effect on the resource or discipline.

Major – impact would have a substantial, highly noticeable influence on the resource or discipline.

Duration. For the purposes of this analysis, duration of the impacts is defined as follows:

Short-term – impacts that would be less than 5 years duration.

Long-term – impacts that would be 5 years or more in duration.

Special Status Species

For the purposes of the analyses for Mexican spotted owl, California condor, and peregrine falcon, conclusion of effects were described utilizing the standard U.S. Fish and Wildlife terminology for biological assessments.

Cultural Resources and Section 106 of the National Historic Preservation Act

In this environmental assessment, impacts to cultural resources are described in terms of type, context, duration, and intensity, as described above, which is consistent with the regulations of the Council on Environmental Quality (CEQ) that implement the National Environmental Policy Act (NEPA). These impact analyses are intended, however, to comply with the requirements of both NEPA and Section 106 of the National Historic Preservation Act (NHPA). In accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 of the NHPA (36 CFR Part 800, Protection of Historic Properties), impacts to cultural resources were identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that were either listed in or eligible to be listed in the National Register of Historic Places; (3) applying the criteria of adverse effect to affected cultural resources either listed in or eligible to be listed in the National Register; and (4) considering ways to avoid, minimize or mitigate adverse effects.

Under the Advisory Council's regulations a determination of either adverse effect or no adverse effect must also be made for affected cultural resources. An adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualify it for inclusion in the National Register, e.g. diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the preferred alternative that would occur later in time, be farther removed in distance or be cumulative (36 CFR Part 800.5, Assessment of Adverse Effects). A determination of no adverse effect means there is an effect, but the effect would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the National Register.

CEQ regulations and the National Park Service's Conservation Planning, Environmental Impact Analysis and Decision-making (DO-12) also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect as defined by Section 106 is similarly reduced. Although adverse effects under Section 106 may be mitigated, the effect remains adverse.

A Section 106 summary is included in the impact analysis sections for cultural resources under the preferred alternative. The Section 106 Summary is intended to meet the requirements of Section 106 and is an assessment of the effect of the undertaking (implementation of the alternative) on cultural resources, based upon the criterion of effect and criteria of adverse effect found in the Advisory Council's regulations.

Cumulative Impact

Cumulative impact is defined as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place

over a period of time (40 CFR 1508.7). Therefore it is necessary to identify other ongoing or foreseeable future projects within Desert View or surrounding areas. For this analysis, foreseeable future actions were considered to be actions that could occur in the vicinity of Desert View and Grand Canyon Village within the next five years that currently have funding or funding is actively being sought. Five years was selected as the time frame for foreseeable future actions because most of the direct and indirect impact of the proposal would occur within five years. Many of the foreseeable future actions are proposed in the *Grand Canyon National Park General Management Plan* 1995.

Desert View

The projects that are in or near the Desert View area and included in the cumulative impact analysis for each impact topic are listed below. All of these changes would be made to meet the recommendations of the 1995 General Management Plan.

Wastewater Treatment Facility: The existing wastewater treatment facility is proposed to be upgraded to meet increased demand. The effects of the proposed wastewater treatment facility were documented in a September 2000 EA.

Campground. The existing 50-site campground has been proposed to be expanded to 100 sites. The campground is approximately .4 kilometers (.25 miles) east of Desert View. The planning and analysis for this facility has not yet begun but may begin within the next five years.

Visitor Services. The following changes to visitor services are proposed.

- *Roads, Parking and Walkways:* The existing visitor parking area is proposed to be demolished and replaced with new larger parking areas to meet the needs of increased visitation. The primary roadway would be moved back from the rim by approximately ¼ mile. New walkways including a pedestrian plaza area would connect the new parking to existing facilities. Picnic tables in a designated picnic area would be located near new walkways.
- *Entrance Station*. A new entrance station would be constructed to serve the revised roadway alignment.
- *Concessioner Services*. Improvements to the Trading Post, Food Services, and General Store facilities would be made.
- *Visitor Contact Station and Bookstore*: Improvements to these facilities would be made.
- *Restroom.* A new restroom would be constructed near the new parking areas.

Grand Canyon Village

The projects that are in or near the Grand Canyon Village area and included in the cumulative impact analysis for each impact topic are listed below:

Greenway. A trail system for bicyclists and pedestrians is proposed to promote alternative modes of transportation, provide efficient movement of visitors between major points of interest, and maintain a quality visitor experience. The trail system would be located between Desert View and Grand Canyon Village. The planning and analysis for the Greenway is in the beginning stages and it is not known whether the proposed work would take place within the next five years.

Transit System. A transit system is proposed to be developed between Tusayan and Grand Canyon Village. An improved South Rim transit system is also proposed that would include service to points along the East Rim Drive including Desert View. The planning and analysis for the transit system is ongoing. It is not known how much of the proposed work would take place within the next 5 years.

Impairment

In addition to determining the environmental consequences of the preferred and other alternatives, National Park Service policy (*Management Policies 2001*) requires analysis of potential effects to determine whether or not actions would impair park resources.

The fundamental purpose of the national park system, established in the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of the park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute an impairment. An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to the opportunities for enjoyment of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning document.

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. A determination on impairment is made for every impact topic in each alternative.

ALTERNATIVE A – NO ACTION

Biotic Communities

Direct/Indirect Impacts. This alternative would not implement any ground disturbing activities and thus there would be no impacts to the biotic communities at Desert View.

Cumulative Impacts. In addition to the existing habitat lost due to existing developments, roads, and utility corridors, loss of juniper/big sagebrush/pinyon pine community type would occur due to foreseeable future developments in and around Desert View. The extent of this loss is unknown because preliminary site designs for the future developments have not occurred. However, habitat loss would probably be negligible in context with the 2,750 hectares (68,000 acres) of juniper/big sagebrush/pinyon pine community type present within Grand Canyon National Park.

In addition to loss of habitat, the cumulative impacts of implementing this alternative would be decreased wildlife security, increased disturbance to adjacent habitat, and increased fragmentation. However, these impacts would be negligible because they would primarily occur in areas currently degraded due to high disturbance levels from existing developments, roads, utility corridors, and human use.

Impairment. The no action alternative would be expected to have no direct or indirect impacts. The cumulative impacts (due to other foreseeable future development) could consist of minor, long term adverse impacts on ponderosa-pinyon-gambel oak-juniper habitat due to the removal of small

numbers of trees in some areas to accommodate buildings and related improvements. These impacts would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park. In addition, minor losses of this habitat type would not harm the integrity of the park due to the ubiquity of this habitat type at Grand Canyon National Park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. No direct/indirect impacts would be expected due to the no-action alternative. Cumulative impacts (due to other foreseeable future development) would be negligible because impacts would primarily occur in areas where the biotic communities are already degraded.

Exotic Vegetation and Noxious Weeds

Direct/Indirect Impacts. The no-action alternative would not implement any ground disturbing activities and thus there would be no direct or indirect impacts to exotic vegetation and noxious weeds.

Cumulative Impacts. Ongoing exotic vegetation control programs would continue, which includes hand pulling, mechanical treatments, and a small amount of herbicide control. However, due to the size of the current program (mostly volunteer work) existing populations of exotic vegetation would continue to slowly spread and replace native vegetation. This would most likely occur along roads and utility corridors.

Proposed foreseeable future developments would create disturbed areas. Exotic vegetation and noxious weeds generally invade disturbed sites, and thus future developments would increase the potential for spread or introduction of exotic vegetation and noxious weeds. Project specific mitigation measures would be implemented for these future projects to reduce the potential for spread or introduction of exotic vegetation, so cumulative impacts would be minor and long-term.

Impairment. For reasons described above, the no-action alternative would have no direct or indirect impacts, and would have only a potential long-term minor cumulative impact (due to other foreseeable future development). These impacts from exotic vegetation would not constitute impairment. Although not desirable, minor increases in exotic vegetation would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park. In addition, minor increases in exotic vegetation would not harm the natural integrity of the park because it would be limited in extent.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. No direct or indirect impacts would be expected due to the no-action alternative. Cumulative impacts (due to other foreseeable future development) would be minor and long-term, and would include the continued spread of existing populations and minor increase in risk of spread or introduction of exotic vegetation.

Mexican Spotted Owl

Direct/Indirect Impacts. No vegetation manipulation or construction activities are proposed under Alternative A. Therefore the existing condition would remain the same. No Mexican spotted owl habitat would be altered, and no new sources of disturbance would be introduced with this alternative. There would be no direct or indirect impacts to Mexican spotted owls associated with this alternative.

Cumulative Impacts. Ongoing activities at Desert View create year-round disturbance in the vicinity. This continual disturbance has decreased the quality of habitat in and around Desert View for Mexican spotted owls.

Foreseeable future developments might affect spotted owl habitat through loss of foraging habitat and increased disturbance during construction. However, the loss of foraging habitat is unlikely to affect the spotted owl because foraging habitat is marginal quality due to the high level of existing development, roads, and human use. In addition, relative to the amount of available foraging habitat, the area affected would be negligible, and the forest community types within a 1.6 kilometer (1 mile) radius of Desert View are not considered quality nesting or roosting habitat. The proposed greenway would have a higher potential of affecting spotted owls. The greenway would be located between Desert View and Grand Canyon Village. The greenway would probably concentrate hikers and bikers above and away from potential nesting and roosting habitat, but until more site specific designs are developed, it is difficult to determine the level of disturbance on potential nesting and roosting habitat.

Until the presence of spotted owls can be definitively determined, mitigation measures to limit disturbance from construction activities during breeding season would be implemented. Therefore any potential cumulative impacts due to other foreseeable future developments would be negligible and long-term.

Impairment. The no-action alternative would have no direct or indirect impacts. The cumulative impacts (due to other foreseeable future development) would be negligible and long-term for reasons described above. Because potential impacts would be negligible, they would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park, nor would they harm the natural integrity of the park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. Alternative A would have no direct or indirect impacts on the Mexican spotted owl. Cumulative impacts (due to other foreseeable future development) would be negligible and long-term, because foraging habitat which might potentially be lost is of marginal quality due to the high level of existing development, roads, and human use, and because mitigation measures to limit disturbance due to construction activities would be taken.

California Condor

Direct/Indirect Impacts. No vegetation manipulation or construction activities are proposed under Alternative A. Therefore the existing condition would remain the same. No California condor habitat would be impacted, and no new sources of disturbance would be introduced with this alternative. There would be no direct or indirect impacts to California condor associated with this alternative.

Cumulative Impacts. Existing developments at Desert View create year-round human presence in the vicinity of Desert View. Foreseeable future developments would be primarily contained to existing developed areas and thus would have a negligible cumulative long-term impact on condor habitat.

Impairment. The no-action alternative would be expected to have no direct or indirect impacts. The cumulative impacts (due to other foreseeable future development) would be negligible and long-term for reasons described above. Because potential impacts would be negligible, they would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park, nor would they harm the natural integrity of the park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. Alternative A would have no direct or indirect impacts on the California condor. Foreseeable future developments would be primarily contained to existing developed areas and thus would have a negligible long-term cumulative impact on condor habitat.

American Peregrine Falcon

Direct/Indirect Impacts. No construction activities are proposed under Alternative A. Therefore the existing condition would remain the same. No peregrine falcon habitat would be impacted, and no new sources of disturbance would be introduced with this alternative. There would be no direct or indirect impacts to American peregrine falcons associated with this alternative.

Cumulative Impacts. Ongoing activities at Desert View create year-round disturbance in the vicinity. This continual disturbance appears not to be affecting the pair in the Desert View area so it is likely they have become adapted to the disturbance.

The incremental development of Desert View is unlikely to adversely affect peregrine falcons. The majority of the developments would occur in existing disturbed areas and would not measurably change prey base populations. In addition, none of the foreseeable future developments would affect nesting habitat below the rim nor increase use of the area below the rim. Therefore implementation of this alternative would have no cumulative impacts.

Impairment: The no-action alternative would have no impacts. There would be no impairment because the NPS would not be hindered from fulfilling the purpose of the park. Opportunities for enjoyment of the park would not be precluded, nor would there be harm to the natural integrity of the park.

Because there would be no impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. Alternative A would have no impacts on the American peregrine falcon.

Cultural Resources

Direct/Indirect Impacts. This alternative, which would involve no construction and would continue current NPS management actions for the Desert View area, would be expected to have no direct or indirect impact on cultural resources including identified archaeological and ethnographic resources.

Despite the continuation of existing NPS policies for cultural resources protection, increasing visitor use has the potential to adversely affect archaeological and ethnographic resources. Without a corresponding increase in the park's ability to effectively monitor resource conditions, or to impart the importance of protecting resources (and enforce penalties for disturbance) there may be a greater likelihood for visitors to degrade ethnographic sites.

Cumulative Impacts. Archaeological and ethnographic resources have sustained previous adverse effects from road construction and other development activities. Loss or disturbance of these resources due to foreseeable future development (in conjunction with previous losses and prevailing threats to finite numbers of sites throughout the region) could incrementally diminish the overall understanding of Grand Canyon's cultural history, particularly with regard to prehistoric Ancestral Puebloan people, and more recent Native American use of the area.

Increasing visitor use and other foreseeable development at Desert View poses a long-term moderate risk that archaeological or ethnographic resources may be disturbed or diminished without an adequate increase in the park staff's ability to monitor resource conditions, effectively manage visitor use, and implement measures to abate impacts.

Steps should be taken to preclude or minimize loss or disturbance of cultural resources as part of any other foreseeable future development, so that any long-term cumulative impacts would be minor.

Impairment. This alternative would have no direct or indirect impacts and the potential for only a long-term, minor, cumulative impact on cultural resources. These minor impacts would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park. In addition, these minor impacts would not harm the cultural integrity of the park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. There are expected to be no direct or indirect effects on cultural resources as a consequence of the continuation of current NPS management actions and policies for the area. Increasing visitor use and other foreseeable development at Desert View, however, poses a long-term moderate risk that archaeological or ethnographic resources may be disturbed or diminished without an adequate increase in the park staff's ability to monitor resource conditions, effectively manage visitor use, and implement measures to abate impacts. Steps should be taken to preclude or minimize loss or disturbance of cultural resources as part of any other foreseeable future development, so that any long-term cumulative impacts would be minor.

ALTERNATIVE B

This alternative results in no changes at Desert View. Staffing and management at Desert View are unlikely to change under this alternative because of the impracticability of locating housing and other facilities in locations other than Desert View. Impacts of Alternative B would therefore essentially be the same as for Alternative A.

Biotic Communities

Direct/Indirect Impacts. Alternative B would not implement any ground disturbing and thus there would be no impacts to biotic communities.

Cumulative Impacts. In addition to the existing habitat lost due to existing developments, roads, and utility corridors, loss of juniper/big sagebrush/pinyon pine community type would occur due to foreseeable future developments in and around Desert View. The extent of this loss is unknown because preliminary site designs for the future developments have not occurred. However, habitat loss would probably be negligible in context with the 2,750 hectares (68,000 acres) of juniper/big sagebrush/pinyon pine community type present within Grand Canyon National Park.

In addition to loss of habitat, the cumulative impacts of implementing this alternative would be decreased wildlife security, increased disturbance to adjacent habitat, and increased fragmentation. However, these impacts would be negligible because they would primarily occur in areas currently degraded due to high disturbance levels from existing developments, roads, utility corridors, and human use.

Impairment. Alternative B would involve no ground disturbing activities and would be expected to have no direct or indirect impacts. The cumulative impacts (due to other foreseeable future development) could consist of minor, long term adverse impacts on ponderosa-pinyon-gambel oak-juniper habitat due to the removal of small numbers of trees in some areas to accommodate buildings and related improvements. These impacts would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park. In addition, minor losses of this habitat type would not harm the integrity of the park due to the ubiquity of this habitat type at Grand Canyon National Park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. No direct/indirect impacts would be expected due to this alternative. Cumulative impacts (due to other foreseeable future development) would be negligible because impacts would primarily occur in areas where the biotic communities are already degraded.

Exotic Vegetation and Noxious Weeds

Direct/Indirect Impacts. This alternative would not implement any ground disturbing activities and thus there would be no direct or indirect impacts to exotic vegetation and noxious weeds.

Cumulative Impacts. Ongoing exotic vegetation control programs would continue, which includes hand pulling, mechanical treatments, and a small amount of herbicide control. However, due to the size of the current program (mostly volunteer work) existing populations of exotic vegetation would continue to slowly spread and replace native vegetation. This would most likely occur along roads and utility corridors.

Proposed foreseeable future developments would create disturbed areas. Exotic vegetation and noxious weeds generally invade disturbed sites, and thus future developments would increase the potential for spread or introduction of exotic vegetation and noxious weeds. Project specific mitigation measures would be implemented for these future projects to reduce the potential for spread or introduction of exotic vegetation, so cumulative impacts would be minor and long-term.

Impairment. For reasons described above, this alternative would have no direct or indirect impacts, and would have only a potential long-term minor cumulative impact (due to other foreseeable future development). These impacts from exotic vegetation would not constitute impairment. Although not desirable, minor increases in exotic vegetation would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park. In addition, minor increases in exotic vegetation would not harm the natural integrity of the park because it would be limited in extent.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. No direct or indirect impacts would be expected due to this alternative. Cumulative impacts (due to other foreseeable future development) would be minor and long-term, and would include the continued spread of existing populations and minor increase in risk of spread or introduction of exotic vegetation.

Mexican Spotted Owl

Direct/Indirect Impacts. No vegetation manipulation or construction activities are proposed under this alternative. Therefore the existing condition would remain the same. No Mexican spotted owl habitat would be altered, and no new sources of disturbance would be introduced with this alternative. There would be no direct or indirect impacts to Mexican spotted owls associated with this alternative.

Cumulative Impacts. Ongoing activities at Desert View create year-round disturbance in the vicinity. This continual disturbance has decreased the quality of habitat in and around Desert View for Mexican spotted owls.

Foreseeable future developments might affect spotted owl habitat through loss of foraging habitat and increased disturbance during construction. However, the loss of foraging habitat is unlikely to affect the spotted owl because foraging habitat is marginal quality due to the high level of existing development, roads, and human use. In addition, relative to the amount of available foraging habitat, the area affected would be negligible, and the forest community types within a 1.6 kilometer (1 mile) radius of Desert View are not considered quality nesting or roosting habitat. The proposed greenway would have a higher potential of affecting spotted owls. The greenway would be located between Desert View and Grand Canyon Village. The greenway would probably concentrate hikers and bikers above and away from potential nesting and roosting habitat, but until more site specific designs are developed, it is difficult to determine the level of disturbance on potential nesting and roosting habitat.

Until the presence of spotted owls can be definitively determined, mitigation measures to limit disturbance from construction activities during breeding season would be implemented. Therefore any potential cumulative impacts due to other foreseeable future developments would be negligible and long-term.

Impairment. This alternative would have no direct or indirect impacts. The cumulative impacts (due to other foreseeable future development) would be negligible and long-term for reasons described above. Because potential impacts would be negligible, they would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park, nor would they harm the natural integrity of the park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand

Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. Alternative B would have no direct or indirect impacts on the Mexican spotted owl. Cumulative impacts (due to other foreseeable future development) would be negligible and long-term, because foraging habitat which might potentially be lost is of marginal quality due to the high level of existing development, roads, and human use, and because mitigation measures to limit disturbance due to construction activities would be taken.

California Condor

Direct/Indirect Impacts. No vegetation manipulation or construction activities are proposed under Alternative B. Therefore the existing condition would remain the same. No California condor habitat would be impacted, and no new sources of disturbance would be introduced with this alternative. There would be no direct or indirect impacts to California condor associated with this alternative.

Cumulative Impacts. Existing developments at Desert View create year-round human presence in the vicinity of Desert View. Foreseeable future developments would be primarily confined to existing developed areas and thus would have a negligible cumulative long-term impact on condor habitat.

Impairment. This alternative would be expected to have no direct or indirect impacts. The cumulative impacts (due to other foreseeable future development) would be negligible and long-term for reasons described above. Because potential impacts would be negligible, they would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park, nor would they harm the natural integrity of the park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. Alternative B would have no direct or indirect impacts on the California condor. Foreseeable future developments would be primarily contained to existing developed areas and thus would have a negligible long-term cumulative impact on condor habitat.

American Peregrine Falcon

Direct/Indirect Impacts. No construction activities are proposed under Alternative B. Therefore the existing condition would remain the same. No peregrine falcon habitat would be impacted, and no new sources of disturbance would be introduced with this alternative. There would be no direct or indirect impacts to American peregrine falcons associated with this alternative.

Cumulative Impacts. Ongoing activities at Desert View create year-round disturbance in the vicinity. This continual disturbance appears not to be affecting the pair in the Desert View area so it is likely they have become adapted to the disturbance.

The incremental development of Desert View is unlikely to adversely affect peregrine falcons. The majority of the developments would occur in existing disturbed areas and would not measurably change prey base populations. In addition, none of the foreseeable future developments would affect nesting habitat below the rim nor increase use of the area below the rim. Therefore implementation of this alternative would have no cumulative impacts.

Impairment: This alternative would have no impacts. There would be no impairment because the NPS would not be hindered from fulfilling the purpose of the park. Opportunities for enjoyment of the park would not be precluded, nor would there be harm to the natural integrity of the park.

Because there would be no impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. Alternative B would have no impacts on the American peregrine falcon.

Cultural Resources

Direct/Indirect Impacts. This alternative, which would involve no construction and would continue current NPS management actions for the Desert View area, would be expected to have no direct or indirect impact on cultural resources including identified archaeological and ethnographic resources.

Despite the continuation of existing NPS policies for cultural resources protection, increasing visitor use has the potential to adversely affect archaeological and ethnographic resources. Without a corresponding increase in the park's ability to effectively monitor resource conditions, or to impart the importance of protecting resources (and enforce penalties for disturbance) there may be a greater likelihood for visitors to degrade ethnographic sites.

Cumulative Impacts. Archaeological and ethnographic resources have sustained previous impacts from road construction and other development activities. Loss or disturbance of these resources due to foreseeable future development (in conjunction with previous losses and prevailing threats to finite numbers of sites throughout the region) could incrementally diminish the overall understanding of Grand Canyon's cultural history, particularly with regard to prehistoric Ancestral Puebloan people, and more recent Native American use of the area.

Increasing visitor use and other foreseeable development at Desert View poses a long-term moderate risk that archaeological or ethnographic resources may be disturbed or diminished without an adequate increase in the park staff's ability to monitor resource conditions, effectively manage visitor use, and implement measures to abate impacts.

Steps should be taken to preclude or minimize loss or disturbance of cultural resources as part of any other foreseeable future development, so that any long-term cumulative impacts would be minor.

Impairment. This alternative would have no direct or indirect impacts and the potential for only a long-term, minor, cumulative impact on cultural resources. These minor impacts would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park. In addition, these minor impacts would not harm the cultural integrity of the park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. No direct or indirect effects on cultural resources would be expected as a consequence of this alternative, and of the continuation of current NPS management actions and policies for the area.

Increasing visitor use and other foreseeable development at Desert View, however, poses a long-term moderate risk that archaeological or ethnographic resources may be disturbed or diminished without an adequate increase in the park staff's ability to monitor resource conditions, effectively manage visitor use, and implement measures to abate impacts. Steps should be taken to preclude or minimize loss or disturbance of cultural resources as part of any other foreseeable future development, so that any long-term cumulative impacts would be minor.

ALTERNATIVE C - PREFERRED

Biotic Communities

Direct/Indirect Impacts. Construction activities would be confined to areas disturbed by earlier construction, including areas through which underground utilities have previously been installed. Removal of existing trees and other vegetation would be required in some areas. Wherever practical, soils and plants affected by construction would be salvaged by trained experts for use in site restoration. Site restoration would be included for all newly disturbed areas (including areas where new utilities are necessary). Where practical, site restoration of previously disturbed areas would be included.

These activities would have a negligible direct impact on wildlife populations. There could be a loss of some individuals during construction activities. However, the majority of small mammals, birds and reptiles would be displaced to adjacent habitat.

Some pinyon and juniper trees might die within 3 to 5 years following construction activities due to root damage and soil compaction. Where practical, measures would be taken to protect trees and tree roots in order to prevent this occurrence. If trees were to die and become hazard trees, measures would be taken to remove them.

Indirect impacts of implementing this alternative would include decreased wildlife security, increased disturbance to adjacent habitat, and increased fragmentation. However, these indirect impacts would be negligible because they would occur in areas currently degraded due to high disturbance levels from existing developments, roads, utility corridors, and human use.

Cumulative Impacts. The impacts of past, present, and foreseeable future actions to biotic communities would be similar to those described in the previous section describing direct/indirect impacts. Any cumulative impact due to increased habitat loss would be negligible in context with the 2,750 hectares (68,000 acres) of juniper/big sagebrush/pinyon pine community type present within Grand Canyon National Park.

Impairment. This alternative would have negigible direct, indirect, and cumulative impacts on ponderosa-pinyon-gambel oak-juniper habitat due to the removal of trees in some areas to accommodate buildings and related improvements. These impacts would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park. In addition, minor losses of this habitat type would not harm the integrity of the park due to the ubiquity of this habitat type at Grand Canyon National Park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. Construction activities would be confined to areas disturbed by earlier construction, including areas through which underground utilities have previously been installed. Removal of

existing trees and other vegetation would be required in some areas. Where possible, existing vegetation would be removed by trained experts and replanted in order to revegetate areas disturbed by this alternative or by previous construction. Overall direct, indirect, and cumulative impacts to biotic communities would be negligible due to existing degraded condition of the impacted habitat and the ubiquity of this community type. The biotic community would be improved where previously disturbed areas were revegetated.

Exotic Vegetation and Noxious Weeds

Direct/Indirect Impacts. Ground disturbance under this alternative would increase the potential for spread or introduction of exotic vegetation. However, prevention and mitigation measures implemented with this alternative would reduce the risk of spread and introduction. For instance, pressure washing of ground disturbing equipment would substantially reduce the risk of introducing a new invader. Post construction revegetation, monitoring, and treatment would substantially reduce the risk of spread of existing populations and introduction of a new invader. For these reasons, direct and indirect impacts under this alternative would be negligible.

Cumulative Impacts. Ground disturbance associated with past, present, and foreseeable future developments would increase the potential for spread or introduction of exotic vegetation. However, preventative and mitigation measures associated with all the development projects would substantially reduce the risk of spread or introduction.

The ongoing exotic vegetation control program at Grand Canyon National Park would be augmented with project-related prevention, mitigation, and post treatment activities. This should keep existing populations in check and eliminate any new invaders, and would constitute an improvement over existing exotic vegetation control. For these reasons, cumulative impacts associated with this alternative would be negligible.

Impairment. Direct, indirect, and cumulative impacts from exotic vegetation resulting from this alternative would be negligible. These impacts would not constitute impairment. Although not desirable, any increases in exotic vegetation would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park. In addition, minor increases in exotic vegetation would not harm the natural integrity of the park because it would be limited in extent.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. Prevention and mitigation measures associated with the project should be sufficient to ensure exotic vegetation does not become a major concern at Desert View. Augmented exotic vegetation control measures would provide an improvement to existing controls. For these reasons, direct, indirect and cumulative impacts under this alternative would be negligible.

Mexican Spotted Owl

Direct/Indirect Impacts. Under this alternative activities would be confined to areas previously disturbed by earlier construction. Removal of some existing trees and other vegetation would be required in some areas. It is unlikely that this loss of potential foraging habitat would adversely affect any spotted owls because no owls have been seen at Desert View and the foraging habitat that would be lost is currently of marginal quality due to high disturbance levels from existing developments, roads, and human use. In addition, relative to the amount of available foraging habitat, the amount lost would be negligible.

Impacts to nesting and roosting habitat is not expected to be of concern because nesting or roosting habitat in the vicinity of Desert View would not be expected above the rim.

Surveys are under way to determine the presence or absence of nesting Mexican Spotted Owls in the Desert View vicinity. Two seasons of surveys are needed (to be completed in the summer of 2002). Until the surveys are complete, construction activities that would disturb nesting owls would be limited to the non-breeding season (September 1 to February 28) to reduce the potential for disturbance to nesting birds. If surveys reveal the presence of nesting owls within 0.5 miles of the project site, construction would continue to be limited to the non-breeding season.

Direct and indirect impacts of this alternative would be negligible because any loss of habitat is not likely to directly or indirectly affect owls, and because measures to mitigate potential disturbance to nesting owls would be taken.

Cumulative Impacts. Ongoing activities at Desert View create year-round disturbance in the vicinity. This continual disturbance has decreased the quality of habitat in and around Desert View for Mexican spotted owls.

Foreseeable future developments might affect spotted owl habitat through loss of foraging habitat and increased disturbance during construction. However, the loss of foraging habitat is unlikely to affect the spotted owl because foraging habitat is marginal quality due to the high level of existing development, roads, and human use. In addition, relative to the amount of available foraging habitat, the area affected would be negligible, and the forest community types within a 1.6 kilometer (1 mile) radius of Desert View are not considered quality nesting or roosting habitat. The proposed greenway would have a higher potential of affecting spotted owls. The greenway would be located between Desert View and Grand Canyon Village. The greenway would probably concentrate hikers and bikers above and away from potential nesting and roosting habitat, but until more site specific designs are developed, it is difficult to determine the level of disturbance on potential nesting and roosting habitat.

Until the presence of spotted owls can be definitively determined, mitigation measures to limit disturbance from construction activities during breeding season would be implemented, both for the work proposed under this alternative and for other foreseeable future development. Therefore any potential cumulative impacts due to other foreseeable future developments would be negligible.

Impairment. Direct, indirect, and cumulative impacts from this alternative would be negligible for reasons described above. Because potential impacts would be negligible, they would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park, nor would they harm the natural integrity of the park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. Direct, indirect, and cumulative impacts of this alternative would be negligible because any loss of habitat is not likely to affect owls, and because measures to mitigate potential disturbance to nesting owls would be taken under this alternative and under other foreseeable future developments.

California Condor

Direct/Indirect Impacts. The main concern to California condors from this alternative would be contact with humans. Impacts to nesting or roosting habitat is not of concern because the only potential nesting and roosting habitat near Desert View is below the rim and there is no proposal to affect the habitat or increase visitor use below the rim. Foraging habitat would not be affected because this alternative would not change the availability of food sources for condors around Desert View.

Condor contact with humans would be of concern if visitors harass the birds or if the birds become habituated to humans. Mitigation measures to cease construction activities if condors are present would reduce disturbance from construction activities on the birds. Hazing by permitted park employees would ensure condors do not become habituated to humans. Therefore direct and indirect impacts to condors due to this alternative would be negligible.

Cumulative Impacts. The existing, present, and foreseeable future developments would be primarily contained to the existing developed areas and would be unlikely to affect any condor habitat. Mitigation measures to limit disturbance to birds because of construction activities would be taken. Therefore cumulative impacts due to this alternative would be negligible.

Impairment. This alternative would have neglible impacts on the California condor. These potential impacts would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park. In addition, these potential impacts would not harm the natural integrity of the park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. Direct, indirect, and cumulative impacts on the California condor would be negligible for reasons described above.

American Peregrine Falcon

Direct/Indirect Impacts. The greatest potential concern to American peregrine falcon related to this alternative would be impacts to prey base, and increased disturbance. Impacts to nesting habitat is not of concern because no activities are proposed below the rim where potential nesting habitat occurs, and no activities are proposed within the immediate vicinity of any known nest sites. Thus there would be no increase to disturbance on potential nesting habitat.

Construction activities would be confined to areas previously disturbed by earlier construction. Removal of some existing trees and other vegetation would be required in some areas. Where possible, existing vegetation would be removed by trained experts and replanted in order to revegetate areas disturbed by this alternative or by previous construction.

Loss of habitat used by the prey base would therefore be negligible given the small area being affected relative to the available potential habitat for the prey base. The majority of the prey base utilizing the habitat proposed for removal would be displaced to adjacent habitat.

Disturbance is not a major concern because the pair of falcons in the Desert View vicinity appears to be habituated to human activity. In addition, any mitigation measures to minimize disturbance on Mexican spotted owls would also benefit peregrine falcons by eliminating potential disturbance (including blasting) from construction activities during breeding season (March 1 through June 30).

Direct and indirect impacts to the American peregrine falcon would therefore be negligible.

Cumulative Impacts. The incremental development of Desert View is unlikely to adversely affect peregrine falcons. The majority of existing and foreseeable future developments would occur in existing disturbed areas and would not measurably change prey base populations. In addition, none of the foreseeable future developments would affect nesting habitat below the rim nor increase use of the area below the rim. Cumulative impacts would therefore be negligible.

Impairment. This alternative would have negligible impacts on the American peregrine falcon. These impacts would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park. In addition, these potential minor impacts would not harm the natural integrity of the park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Conclusion. This alternative would have negligible direct, indirect, and cumulative impacts on the American peregrine falcon.

Cultural Resources

Direct/Indirect Impacts. Proposed activities would be in areas disturbed by previous development including areas where underground utilities have been installed. Surveys for archaeological resources within the area of proposed construction have been conducted. No resources were found. As discussed above, mitigation measures would be taken should previously unknown resources be discovered during the course of construction.

Desert View has been a primary visitor area since about 1930, and has many important cultural landscape elements. However, the area of proposed development is well outside of (approximately ¼ mile from) the Desert View Historic District. Furthermore, Cultural Landscape studies being conducted for Desert View have shown no significant elements of the cultural landscape to be within the area of proposed development or to have the potential to be significantly impacted by the proposed development.

The Watchtower is a National Historic Landmark, and is the highest point on the South Rim. It is the most important element of the Desert View Historic District. Photographs taken from the top of the Watchtower indicate that existing buildings in the housing and management support areas are not visible from the Watchtower (or other points within the Historic District) because of topography and vegetation. The elevation of the top of the highest existing building is approximately the same as the top of the highest proposed new building. Therefore proposed new buildings are not expected to be visible from the Watchtower or other points within the Desert View Historic District.

Sites of special ethnographic significance to Native Americans exist at Desert View, though none are known to exist within the bounds of proposed development. Consultation with Native American tribal communities would continue to take place to determine whether any previously unknown ethnographic sites would be disturbed by the proposed activities. Measures to mitigate the impact of the proposed work would be taken as necessary.

Proposed activities would therefore have negligible to minor direct and indirect impacts on cultural resources.

Cumulative Impacts. Archaeological and ethnographic resources have sustained previous impacts from road construction and other development activities. Loss or disturbance of these resources due to foreseeable future development (in conjunction with previous losses and prevailing threats to finite numbers of sites throughout the region) could incrementally diminish the overall understanding of Grand Canyon's cultural history, particularly with regard to prehistoric Ancestral Puebloan people, and more recent Native American use of the area.

Increasing visitor use and other foreseeable development at Desert View potentially poses a long-term moderate risk that archaeological or ethnographic resources would be disturbed or diminished without an adequate increase in the park staff's ability to monitor resource conditions, effectively manage visitor use, and implement measures to abate impacts.

Steps should be taken to preclude or minimize loss or disturbance of cultural resources as part of any other foreseeable future development, so that any long-term cumulative impacts would be negligible.

Impairment. This alternative would have negligible impacts on cultural resources. These impacts would not constitute impairment because they would not prevent the NPS from fulfilling the purpose of the park or preclude the opportunities for enjoyment of the park. In addition, these minor impacts would not harm the cultural integrity of the park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

Section 106 Summary. There will be no impacts to known archeological or ethnographic resources. After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessments of Adverse Effects*), the National Park Service concludes that implementation of the preferred alternative would have *no adverse effect* on the Desert View WatchTower Historic District or any potentially National Register eligible cultural landscapes.

Conclusion. Implementation of this alternative would have *no adverse effect* on the Desert View WatchTower Historic District or on cultural landscapes potentially eligible for the National Register. There would be no impacts to known archeological or ethnographic resources. Direct, indirect, and cumulative impacts of implementation of this alternative would be negligible with proper mitigation measures.

5. CONSULTATION AND COORDINATION

CONSULTATION

The following organizations and agencies were contacted for information or assisted in identifying important issues, developing alternatives, or analyzing impacts.

Arizona Game and Fish Department

In conjunction with other concurrent Desert View compliance efforts, the NPS contacted the Arizona Game and Fish Department (AGFD) to discuss state listed endangered, threatened, and species of concern. The AFGD provided a list of species of concern through a letter dated January 13, 2000.

U.S. Fish and Wildlife Service

In conjunction with this and other concurrent Desert View compliance efforts, the NPS contacted the U.S. Fish and Wildlife Service (USFWS) to discuss listed endangered, threatened, and species of concern. The USFWS provided a list of species of concern through a letter dated September 17, 1999 and April 9, 2001 (see Appendix D). A Biological Assessment will be submitted to the USFWS for concurrence with the NPS's determination that the proposed action may affect but is not likely to adversely affect Mexican spotted owl and California condor.

State Historic Preservation Officer (SHPO)

In conjunction with this and other concurrent Desert View compliance efforts, the NPS contacted the SHPO to discuss cultural landscapes, historical properties and archeological sites. This Environmental Assessment contains an Assessment of Effect for concurrence by the SHPO with the NPS's determination of no impacts to known archeological or ethnographic resources, and no adverse impacts to potential cultural landscapes. There would be no direct impacts to the Desert View Watchtower Historic District and any indirect adverse impacts would be negligible.

Tribal Consultation

In a scoping letter dated March 15, 2001, all affiliated tribes were notified of the proposed project in the Desert View Housing and Management area. Verbal consultation has occurred with park cultural resource staff and interested tribes. This Environmental Assessment will provide interested tribes the opportunity to discuss any issues of concern with the park.

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APPENDIX A

Threatened, Endangered, and Species of Concern

Plants: The U.S. Fish and Wildlife Service has determined that eight federally listed proposed, threatened, or endangered plant species may occur or have habitat in the Grand Canyon area. These species are:

Brady pincushion cactus (*Pediocactus bradyi*) – endangered.
Sentry milk-vetch (*Astragalus cremnophylax* var. *cremnophylax*) – endangered.
Navajo sedge (*Carex specuicola*) – threatened.
San Francisco peaks groundsel (*Senecio franciscanus*) – threatened.
Siler pincushion cactus (*Pediocactus sileri*) – threatened.
Welsh's milkweed (*Asclepias welshii*) – threatened.
Arizona bugbane (*Cimicifuga arizonica*) – candidate.
Fickeisen pincushion cactus (*Pediocacuts peeblesianus* var. *fickeiseniae*) – candidate.

In addition to the federally listed species, the NPS must consider state listed special status species. The Arizona Game and Fish Department has listed the following plant species for consideration for projects occurring on the South Rim.

Bigelow onion (*Allium bigelovii*) – salvage restricted.
Grand Canyon primrose (*Primula specuicola*) – salvage restricted.
Grand Canyon rose (*Rosa stellata* ssp. *abyssa*) – salvage restricted.
Mogollon columbine (*Aquilegia desertorum*) – salvage restricted.
Sentry milk-vetch (*Astragalus cremnophylax* var. *cremnophylax*) – highly safeguarded.
Tusayan flame flower (*Talinum validulum*) – salvage restricted.
Western fairy slipper (*Calypso bulbosa*) – salvage restricted.

Wildlife: In addition to the Mexican spotted owl and California condor, the U.S. Fish and Wildlife Service has listed eight other species as proposed, threatened, or endangered wildlife species that may occur or have habitat in the Grand Canyon area. These species are:

Kanab ambersnail (*Oxyloma haydeni kanabensis*) – endangered.
Black-footed ferret (*Mustela nigripes*) – endangered.
Humpback chub (*Gila cypha*) – endangered.
Razorback sucker (*Xyrauchen texanus*) – endangered.
Southwestern willow flycatcher (*Empidonax traillii extimus*) – endangered.
Little Colorado spinedace (*Lepidomeda vittata*) – threatened.
Bald eagle (*Haliaeetus leucocephalus*) – threatened.
Chiricahua leopard frog (*Rana chiricahuensis*) – candidate.

In addition to the Mexican spotted owl and American peregrine falcon, the Arizona Game and Fish Department has listed the following wildlife species for consideration for projects occurring on the South Rim.

Humpback chub (*Gila cypha*) – wildlife of special concern.
Northern goshawk (*Acipiter gentilis*) – wildlife of special concern.
Southwestern willow flycatcher (*Empidonax traillii extimus*) - wildlife of special concern.
Western red bat (*Lasiurus blossevillii*) – wildlife of special concern.

APPENDIX B

Community Types* within 1 Mile Radius of Desert View

Community Type	Area
Pinyon-Juniper-Big Sage-Cliffrose	8 hectares (20 acres)
Big Sagebrush-Snakeweed-Blue Gramma	16 hectares (40 acres)
Ponderosa-Pinyon-Gambel Oak-Juniper (<40% slope)	20 hectares (50 acres)
Mormon Tea-Snakeweed-Wolfberry	63 hectares (155 acres)
Pinyon-Serviceberry-Gambel Oak	73 hectares (180 acres)
Juniper-Pinyon-Mormon Tea-Greasebush	526 hectares (1,300 acres)
Juniper-Big Sagebrush-Pinyon	587 hectares (1,450 acres)

*Information based on 1982 vegetation surveys conducted by Warren et al (1982).

APPENDIX C

Exotic Vegetation and Noxious Weeds, Grand Canyon, South Rim

Cirsium arvens – canada thistle – prohibited,
Chondrilla juncea - rush skeletonweed - prohibited,
Acroptilon repens – Russian knapweed - restricted
Aegilops cylindrica - jointed goatgrass - restricted,
Alhagi camelorum - camelthorn - restricted,
Cardiara draba - white top - restricted,
Centaurea maculosa - spotted knapweed - restricted,
Centaurea solstitialis – yellow starthistle – restricted,
Centaurea diffusa – diffuse knapweed – restricted,
Linaria dalmatica - dalmation toadflax - restricted,
Onopardum acenthium - scotch thistle - restricted,
Cenchrus incertus - field sandbur - regulated,
Convolvulus arvensis - field bindweed - regulated,
Tribulus terrestris - puncture vine - regulated.

APPENDIX D

Letter from US Fish and Wildlife Service concerning Desert View Housing and Management Support (please see following pages).

United States Department of the Interior
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 FAX: (602) 242-2513

In Reply Refer To:

AESO/SE
2-21-01-I-229

April 9, 2001

Memorandum

To: Superintendent, Grand Canyon National Park, Grand Canyon, Arizona

From: Field Supervisor

Subject: Desert View Housing and Management Support

On March 21, 2001, the Fish and Wildlife Service received your March 15, 2001, scoping letter regarding planning for projects to implement the provisions of the 1995 Grand Canyon National Park General Management Plan in the existing Housing and Management Support areas of Desert View. We offer the following comments.

The scoping letter stated that surveys are planned for the possible presence of threatened and endangered species including the Mexican spotted owl (MSO) (*Strix occidentalis lucida*). It also stated that appropriate mitigating measures would be taken if threatened or endangered species are found, or if their presence is uncertain. If the project is within 0.5 miles of MSO habitat, we recommend that habitat be surveyed for MSO per standard protocol (which includes two years of surveys). If owl(s) are detected and the location qualifies as an owl site, then an appropriate Protected Activity Center (PAC) should be delineated, as recommended by the MSO Recovery Plan. If blasting is to be part of the project, then any MSO habitat within one mile of the project area should be surveyed for MSO. If owl(s) are detected within the distances of the project described above, we recommend that appropriate means (e.g., seasonal restrictions on construction) to eliminate disturbance impacts to MSO be incorporated into the project. It may be possible to accomplish elimination of possible disturbance impacts during informal section 7 consultation of the Endangered Species Act (16 U.S.C. 1531-1544), as amended. If disturbance impacts cannot be eliminated, then formal consultation on this project may be necessary.

California condors (*Gymnogyps californianus*) may regularly occur in or near the project area. Because condors are often attracted to human activity, they could occur at the project site both before and after project completion. We recommend that Grand Canyon National Park (GRCA) coordinate with Peregrine Fund personnel to determine if condors are roosting within 1 mile of the project area prior to any blasting activity. If condors occur within one mile, blasting should be postponed until the condors leave the area. Procedures should be developed and implemented to monitor, prevent, and immediately remove any fuels or fluids discharged from vehicles or

equipment in the project area where condors could occur. If condors approach or are found at the project area during construction, GRCA should coordinate with Peregrine Fund personnel to determine the appropriate action to be taken. Once the project is completed, if condors are attracted to or frequently roost in the area, then such a situation should be addressed by the California Condor Reintroduction Working Group.

Thank you for the opportunity to comment on the proposed project. If we can be of further assistance, please contact Bill Austin (520) 527-0849 or Debra Bills (602) 242-0210 (x239).

David L. Harlow

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
Field Supervisor, Fish and Wildlife Service, Albuquerque, NM
John Kennedy, Arizona Game and Fish Department, Phoenix, AZ

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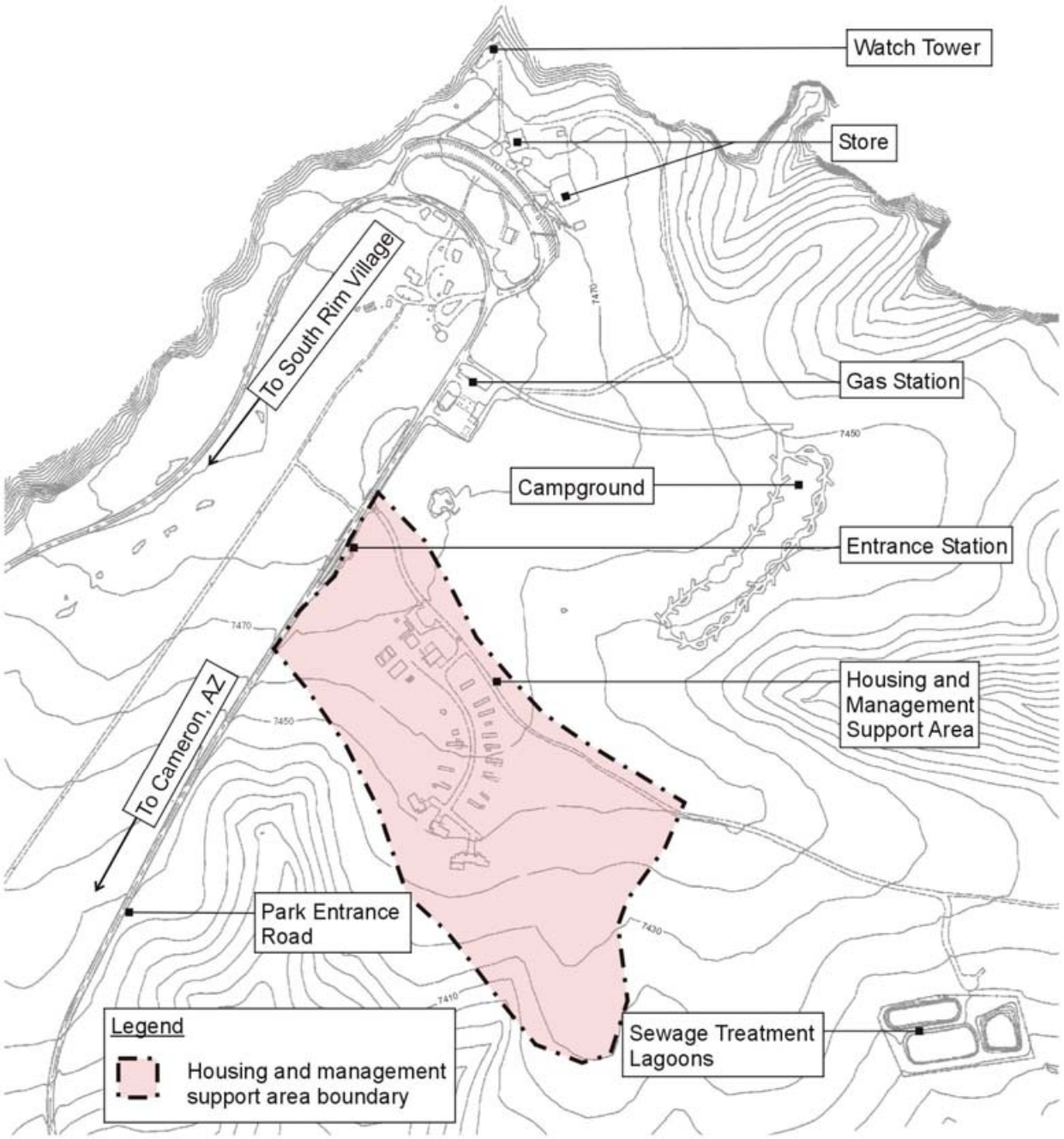
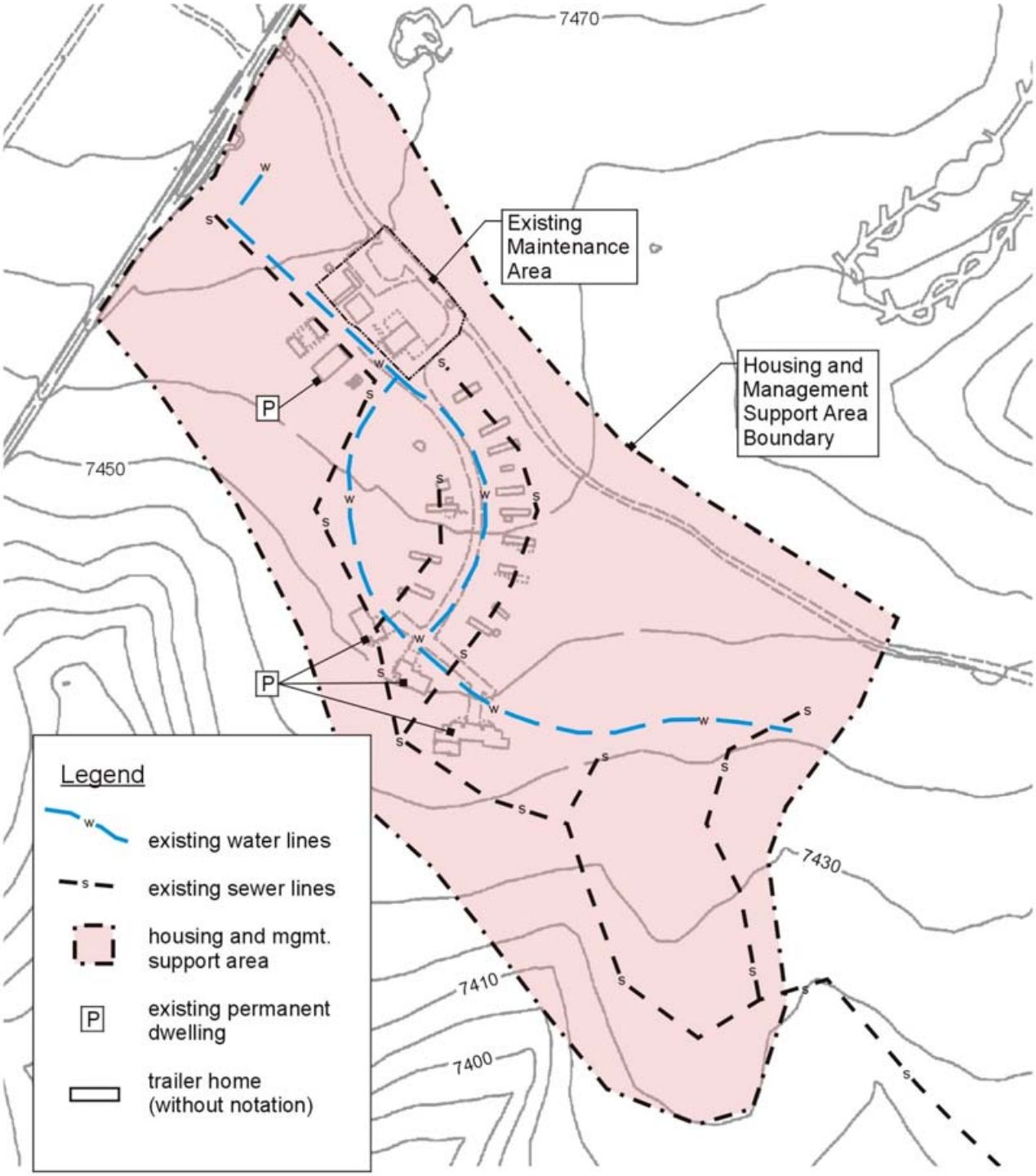
APPENDIX E

Vicinity Maps



Vicinity- Desert View Area

Grand Canyon National Park



Desert View

Housing and Management Support Area

Grand Canyon National Park